SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION
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July 5, 2013

TO: Commissioners and Alternates

FROM: Lawrence Goldzband, Executive Director (415/352-3653 larryg@bcdc.ca.gov)
Rafael Montes, Senior Engineer (415/352-3670 rafaelm@bcdc.ca.gov)

SUBJECT: Recommendation Engineering Criteria Review Board Appointments
(For Commission consideration on July 18, 2013)

Summary and Recommendations

The staff recommends that the Chair, with the Commission's concurrence, appoint Mr. Robert Battalio, P.E. (Coastal Engineer), and Mr. Jim French, P.E., G.E. to serve on the Commission's Engineering Criteria Review Board.

Staff Report

The Engineering Criteria Review Board (ECRB) advises the Commission on problems relating to the safety of fills and of structures on fills as prescribed in Regulation 10271. In addition to this regulation, the San Francisco Bay Plan's Policy No. 1 under the section of Safety of Fills requires that the ECRB consist of not more than eleven (11) members, including geologists, architects and civil engineers specializing in geotechnical and coastal engineering. Currently, there is one coastal engineer serving on the Board.

This year, the ECRB's membership includes six members: four civil engineers specializing in geotechnical, seismology and structural engineering, one architect and one geologist. Last December, Professor Edward Wilson, a renowned Structural Engineer who served on the board since 1984 retired, followed this past February by Mr. George Fotinos, S.E. (Structural Engineer) and Mr. Maury Power, G.E. (Geotechnical Engineer). Mr. Fotinos and Mr. Power served on the board since 2001 and 2007, respectively. The retirements reduced the number of Board members to six. Therefore, BCDC has reached out among several prominent candidates seeking to replace the retiring members. The Commission's ECRB is recommending that the Chair of the Commission appoint Mr. Robert Battalio, a Coastal Engineer, and Mr. James B. French, G.E., a Geotechnical Engineer, to serve on the Board. This action would increase the number of ECRB members to eight. BCDC will seek to fill the three remaining vacancies in the future. The following is a summary of the new candidates' professional backgrounds.

Mr. Battalio, a registered professional engineer with a Masters in Engineering from UC Berkeley, is a renowned Coastal Engineer with over 25 years of experience with flood management, restoration design, coastal engineering, preparation of construction documents, and project management. His training and work experience is focused in the coastal and estuarine areas, wetland and creek restoration design, and waterfront civil engineering projects. His experience in San Francisco Bay includes the BCDC sea level rise study published in 1990, and multiple wetland restoration, dredging, shore armoring and shore modification projects. Bob was also one of the study leaders in the development of FEMA's Pacific Coast Flood

Hazard Mapping Guidelines, as well as Project Director for a study of coastal erosion response to climate change for Pacific Institute and the California Ocean Protection Council. Bob is assisting Alameda County and FEMA review Bay flood studies to develop their methodology for coastal flood mapping in Alameda County.

Some of his most relevant work experience includes:

South San Francisco Bay Salt Ponds Restoration Studies, Counties of Alameda, Santa Clara and San Mateo, CA. 2003-present for the California State Coastal Conservancy. Technical support of a programmatic evaluation of the feasibility of restoring up to 15,000 acres of salt ponds in south San Francisco Bay, and the associated flood protection needs. Bob led the analysis of coastal flood criteria for conceptual description of a new coastal flood protection system. Analysis included extreme high estuarine water levels, wind set up, wind wave generation, transformations and run up, and effects of marshes, and relative sea level rise. Bob is the engineer of record for the wetland restoration under construction in Eden Landing (just south of San Mateo Bridge), which one of the Phase 1 restoration actions.

Corte Madera Bay Shoreline Study, CA, 2010. For the San Francisco Bay Conservation and Development Commission (BCDC), and in cooperation with the San Francisco Estuary Project and the USGS, evaluating shore adaptation strategies and alternatives on the Bay shore in Marin County. The analysis is multi-objective and focused on evaluating and using the flood and erosion management attributes of tidal wetlands to augment more traditional flood defenses.

Alameda County Coastal Flood Study, CA. 2009-present. For Alameda County, reviewing coastal flood studies by the US Army Corps and FEMA contractors, and recommending a methodology to complete the coastal flood studies in southern Alameda County. A range of technical aspects include hydrodynamic bay models, wave generation and propagation modeling, statistical analyses of joint probability and extreme value distributions, wave runup, overtopping and dissipation over mudflats and marshes.

Napa River Salt Marsh Restoration, Pablo Bay / Napa River, CA, 1998–2006. For the California State Coastal Conservancy, Department of Fish & Game and U.S. Army Corps of Engineers. Project director for a series of studies and design for restoration for the 10,000-acre Napa Salt Ponds Complex. Included conceptual design, modeling of hydrodynamics, sediment transport and salinity, habitat conversion modeling, engineering feasibility, final design and construction period services. Also, field data collection and analysis, and coordination with surveying and EIR/EIS preparation, and conformance with Corps' procedures. Engineer-in-charge of construction documents for the restoration of Ponds 3, 4 and 5, which comprised about 3,000 acres, to tidal wetland. Construction was completed successfully in 2006.

Hayward Shoreline Sea-Level Rise Study, Hayward, CA. 2009 – Present. Project Director. For the East Bay Regional Park District. ESA PWA is conducting a preliminary study on the affect of sea-level rise over a 50-year planning horizon on the resources of the Hayward shoreline and the actions that could be taken to protect both the wetlands and shoreline development in this area. ESA PWA is examining potential impacts to the Hayward area to the north of Highway 92 and providing recommendations for possible mitigation measures to protect existing and planned uses along the shoreline.

For a more comprehensive review of Mr. Battalio's professional qualifications, please see the Curriculum Vitae attached.

Mr. French is a graduate of UC Berkeley with a B.S. degree in Civil Engineering in 1978 and a M.S. in Geotechnical Engineering in 1982. He has over 30 years of experience in geotechnical, environmental, and construction engineering. He has served as project manager or design engineer on a wide range of projects, including earth dams, levees, landslides, port facilities, waste treatment and handling, hazardous waste disposal cells, office buildings, and subdivisions. After the January 12, 2010 Haiti Earthquake, Mr. French was part of an 11-member team, supported by the National Science Foundation and led by University of Texas at Austin, that performed reconnaissance investigations of the earthquake's ground-movement effects for a report to the professional community. As a seismic expert, he assisted in the development of a scientific report on the earthquakes' geotechnical effects.

Some of his published work includes:

"Geotechnical Aspects of Failures at Port-au-Prince Seaport during the 12 January 2010 Haiti Earthquake." R. A. Green, S. M. Olson, B. R. Cox, G. J. Rix, E. Rathje, J. Bachhuber, J. French, S. Lasley, and N. Martin. Earthquake Spectra, The Professional Journal of the Earthquake Engineering Research Institute, Volume 27, Number S43, October 2011.

"Documenting Liquefaction and Lateral Spreading Triggered by the 12 January 2010 Haiti Earthquake." S. M. Olson, R. A. Green, S. Lasley, N. Martin, B. R. Cox, E. Rathje, J. Bachhuber, and J. French. *Earthquake Spectra,* The Professional Journal of the Earthquake Engineering Research Institute, Volume 27, Number S93, October 2011.

"Geotechnical Engineering Reconnaissance of the 2010 Haiti Earthquake." Report of the National Science Foundation-Sponsored Geoengineering Extreme Events Reconnaissance (GEER) Team. E. Rathje, J. Bachhuber, B. Cox, J. French, R. Green, S. Olson, G. Rix, D. Wells, O. Suncar. GEER Association Report No. GEER-021. February 22, 2010.

"Clarifying the Application of Subgrade Modulus in Structural Analysis and Design." J. French, D. Mack, R. Shafer, and K. Moore. Proceedings of the 100th Anniversary Earthquake Conference Commemorating the 1906 San Francisco Earthquake, San Francisco, CA. April 2006.

"Importance of Seismological-Geotechnical-Structural Handshake in Performance-Based Design of Waterfront Structures." J. French, J.P. Singh, and M. Tabatabaie. Proceedings of the Structural Engineers World Conference 2002 in Yokohama, Japan. 2002.

"Importance of Seismological-Geotechnical-Structural Handshake in Performance-Based Design of Waterfront Structures." J. French, J.P. Singh, and M. Tabatabaie. Proceedings of the Structural Engineers Association of California Convention 2002, Santa Barbara, CA. September 2002.

"Geotechnical and Ground Motion Issues in Seismic Vulnerability Assessment of Existing Wharf Structures." J. French, J.P. Singh, and M. Tabatabaie. ASCE Ports 2001 Conference, Norfolk, VA. April 29–May 2, 2001.

Some of his most relevant work experience includes:

San Francisco Bay Area Rapid Transit (BART) District Earthquake Safety Program, Onshore Vibro-Replacement and Grouting along Transbay Tube, BART, Oakland, CA. 0058480034. Task manager for geotechnical support during the construction of more than 900 stone columns in the Port of Oakland, the first mitigation measure of the billion-dollar BART Earthquake Safety Program. Responsible for working with the contractor to develop data collection and reporting methods that would meet the contractual requirements and optimize information about the quality of the stone column installation methods. After the initial test area did not produce the required densification, worked with the contractor to develop and evaluate improved installation procedures to meet the contract performance criteria. Provided a final review of all borings drilled to evaluate conformance to performance criteria, and developed improved performance criteria to address specific conditions encountered during testing. Recommended remedial measures as needed where performance criteria were not met.

San Francisco Bay Area Rapid Transit (BART) District Earthquake Safety Program, Offshore Demonstration Program for Vibro-Replacement along Transbay Tube, BART, Oakland, CA. 0058480036. Task manager responsible for providing geotechnical direction during the construction and testing of more than 90 demonstration stone columns and vibro-compaction points. The work was performed in 35 to 90 feet of water to evaluate the ability to position, install, and test stone columns and vibro-compaction in the San Francisco Bay. The demonstration program included elaborate survey control, pretreatment testing with borings and cone penetrometer tests (CPTs), installation of stone columns and vibro-compaction points, posttreatment testing with borings and CPTs, and evaluation of the penetrability of the thickened stone blanket of a scour-prone portion of the Transbay Tube with sonic drilling and vibro-densification equipment. Provided extensive reviews and feedback during the development and testing of several survey control methods, including differential GPS, sonar, and laser-gyro, as well as MiniSpool technologies. Managed and evaluated geotechnical testing that included standard penetration tests, large-diameter penetration tests, CPTs, and laboratory tests.

California High-Speed Train, San Jose to Merced Segment, California High Speed Rail Authority, Santa Clara, San Benito, Merced, and Madera Counties, CA. 0145060000. Lead geotechnical engineer for ongoing geologic and geotechnical studies of the proposed High Speed Train, San Jose to Merced segment. Previously provided preliminary recommendations for numerous aerial structures, bridges, cuts, fills and about 9 miles of tunnels through Pacheco Pass. Current scope includes geologic and geotechnical services to support 30 percent design phase.

Caltrain Grade Separation Projects, San Bruno and South San Francisco, CA. Prior Firm Experience. Project manager for a geotechnical investigation of two miles of mechanically stabilized earth (MSE) embankment. The proposed project, which was to include a station with stairwells and elevator pits, would raise the commuter and freight railroad tracks 16 feet to cross above surface streets. Because more than 3,000 feet of this length are immediately adjacent to the San Francisco Bay Area Rapid Transit District (BART), we developed recommendations to use lightweight foam concrete so that overburden pressures on the BART subway would not be increased. Portions of the site are underlain by compressible clays or liquefiable silty sands; other reaches overlie soft, compressible clays and liquefiable soils. Evaluated settlement and global stability.

For a more comprehensive review of Mr. French's professional qualifications, please see the Curriculum Vitae attached.

ESA

ROBERT BATTALIO, P.E.

Principal Coastal Engineer, Chief Engineer, Vice President

A registered professional engineer with a Masters in Engineering from UC Berkeley, Bob Battalio has nearly 30 years of experience with flood management, restoration design, coastal engineering, preparation of construction documents, and project management. His training and work experience is focused in the coastal and estuarine areas, wetland and creek restoration design, and waterfront civil engineering projects. His experience in San Francisco Bay includes the BCDC sea level rise study published in 1990, and multiple wetland restoration, dredging, shore armoring and shore modification projects. Bob was also one of the study leaders in the development of FEMA's Pacific Coast Flood Hazard Mapping Guidelines, as well as Project Director for a study of coastal erosion response to climate change for the Pacific Institute and the California Ocean Protection Council. Bob has had professional engineering charge of numerous constructed projects including 4,000 acres of tidal wetlands and miles of creek and shore bank enhancement for ecology, hazard reduction and public use.

Education

M.E., Civil Engineering (Coastal Engineering), University of California, Berkeley

B.S., Civil Engineering, Virginia Polytechnic Institute and State University, Summa Cum Laude

Certifications/Registrations

Civil Engineer, State of California, C41765

Professional Engineer, State of Washington, #42109

Professional Engineer, State of Louisiana, #34927

Professional Engineer, State of Oregon, # 83446

Professional Affiliations

Chi Epsilon National Civil Engineering Honor Society

American Society of Civil Engineers

American Shore and Beach Preservation Association (Years 2000–2008 Director, Presently Northern California Vice President)

The Surfrider Foundation

Relevant Experience

Ballona Wetlands Restoration: Development and Evaluation of Restoration Alternatives and Conceptual Restoration Design, Los Angeles, CA. For the California Coastal Conservancy. Bob is serving as the Principal Engineer directing the engineering design for the enhancement of 600-acres of the Ballona Wetlands in Los Angeles County. The plan enhances wetland resources, preserve open space and creates managed public access compatible with the natural resources of the site.

Ventura County Climate Change Vulnerability Study, Ventura, CA. 2011 – Present. Client: The Nature Conservancy. Project Director. The Ventura County Climate change project with the Nature Conservancy is part of the Coastal resiliency project www.coastalresilience.org. ESA is conducting climate change modeling examining changes to coastal hazards of flooding and erosion from sea level rise and increased storminess, and fluvial flooding based on changes to precipitation.

Southern Monterey Bay Coastal Regional Sediment Management Plan and Erosion Mitigation Alternatives, CA, 2007-2012. For the Association of Monterey Bay Area Governments (AMBAG) with funding from the Coastal Sediment Management Workgroup (CSMW), developed the first coastal regional sediment management plan in CA in 2008. The second phase developed cost benefit analysis that include ecological and recreational values along with the more easily estimated land, development and shore protection values. The second Phase was completed in 2012, was led by the Monterey Bay Marine Sanctuary Foundation, and includes an advisory body called the Southern Monterey Bay Coastal Erosion Workgroup.

Relevant Experience (Continued)

Monterey Bay Sea Level Rise Hazard Mapping, 2012-present. For the Monterey Bay Marine Sanctuary Foundation. Project Director and Engineer. The erosion and flood hazards are being computed and mapped for the Monterey Bay shore in order to ascertain exposure due to sea level rise and sediment deficits through the year 2100. This project builds upon prior work and is part of a long-term series of projects progressing toward regional coastal zone management and adaptation planning.

San Francisco Littoral Cell Coastal Regional Sediment Management Plan (CRSMP), San Francisco, CA. Project Director. A CRSMP is a comprehensive guidance and policy document that discusses how regional sediment management can be implemented in an expeditious, cost-effective, and resource-protective manner. ESA is completing the CRSMP for a segment of the Golden Gate Littoral Cell along the Pacific Ocean shores of San Francisco, Daly City and Pacifica.

Coastal Infrastructure and Vulnerability Impacts Assessment CA, -2008, For the Ocean Protection Council and Pacific Institute. Project Director. ESA mapped coastal erosion hazards resulting from sea level rise scenarios, evaluated geomorphic response of various backshore types by applying a total water level methodology, collaborated with climate change researchers at Scripps, engaged with a peer review team arranged by the Ocean Science Trust, and collaborated with Pacific Institute to identify economic impacts associated with coastal erosion hazards.

Ocean Beach Master Plan, San Francisco, CA. 2010-present. ESA is providing coastal processes and engineering to the San Francisco Urban Planning + Research (SPUR) in support of a Master Plan for San Francisco's Ocean Beach. SPUR led a team that developed a long-term shore management vision for the City / County and the National Park Service, Golden Gate National Recreation Area. The master plan is being detailed with additional analysis, and augmented with an Inter-Agency Coastal Management Framework for implementation of plan elements. Key considerations are coastal processes and erosion / flood hazards, sea level rise, infrastructure and property vulnerability and maintenance of the natural shore.

South San Francisco Bay Salt Ponds Restoration Studies, Counties of Alameda, Santa Clara and San Mateo, CA. 2003-2012 for the California State Coastal Conservancy. Technical support of a programmatic evaluation of the feasibility of restoring up to 15,000 acres of salt ponds in South San Francisco Bay, and the associated flood protection needs. Bob led the analysis of coastal flood criteria for conceptual description of a new coastal flood protection system. Analysis included extreme high estuarine water levels, wind set up,

Relevant Experience (Continued)

wind wave generation, transformations and run up, and effects of marshes, and relative sea level rise. Bob is the engineer of record for the wetland restoration constructed in Eden Landing in 2012(just south of San Mateo Bridge), which was one of the Phase 1 restoration actions.

Mission Creek / Laguna Channel Restoration, Santa Barbara, CA. Project Director. 2011 – Present. For the City of Santa Barbara. Mission Creek Lagoon is a small coastal lagoon located along the Santa Barbara, California waterfront. The lagoon is formed by the confluence of Mission Creek, a major regional drainage and Laguna Channel, an engineered flood control channel in the location of a formerly extensive wetland complex.ESA is leading a consultant team to restore the Mission Creek lagoon and Laguna, a project that will improve habitat, aesthetics and flood conveyance.

Hayward Shoreline Sea-Level Rise Study, Hayward, CA. 2009 – 2011. Project Director. For the East Bay Regional Park District. ESA conducted study on the affect of sea-level rise over a 50-year planning horizon on the resources of the Hayward shoreline and the actions that could be taken to protect both the wetlands and shoreline development in this area.

Crissy Field Wetland Inlet Studies, San Francisco, CA, 1999-2007. For the National Park Service, Golden Gate Parks Conservancy, and Presidio Trust, Bob led the coastal processes evaluation of the inlet and adjacent shore following construction of a new tidal lagoon in Crissy Field Park. One study resulted in a quantified conceptual model of inlet closure and natural breaching frequency to aid in the adaptive management of the system and evaluation of the benefits of expansion of the wetland.

Pacifica State Beach Restoration, Pacifica, CA - Project Director for coastal processes and civil engineering services for the natural system restoration and enhancement components of this managed retreat project. Elements included removal of development and reconstruction farther landward (residential houses, parking lot, restroom and shower facilities), new public access trails, restoration of the back beach and creek mouth where development was removed, storm water treatment wetlands, and enhancement of dunes. Constructed in 2005.

Surfer's Point, Ventura, CA, 2004 – present. Project Director and Engineer for design of back-shore restoration as part of a managed retreat project at the mouth of the Ventura River. The restoration consists of placing a cobble berm and dunes in the formerly paved area and reconstructing public access in a further landward and less hazardous location. Phase one was constructed in 2011 and sand dunes were added in 2012. Monitoring is underway.

Relevant Experience (Continued)

Scott & Waddell Creeks Bridge Realignment, Santa Cruz County, CA. 2010 to Present. Client – Caltrans. Project Director. Currently, Highway 1 crosses Scott Creek and Waddell Creek at the interface between the ocean and the creeks' lagoons in Santa Cruz County. ESA evaluated the impact of the existing bridges and various alternative bridge designs and alignments. The project focus was on the benefits of replacing the old bridges with revised geometry that intrudes less on physical and ecological processes of the shore and creek estuary habitat.

FEMA Guidelines and Specifications for Coastal Flood Mapping, 2003 – 2006. For Northwest Hydraulics Consultants and the Federal Emergency Management Agency (FEMA). ESA participated in the evaluation and update of FEMA's Guidelines and Specifications for mapping of coastal flood hazards. Bob led several key technical areas: wave transformations, wave runup and overtopping of shores and shore structures, definition of the 100-year event in terms of joint occurrence of high wind wave and high water levels, wind wave generation in embayments such as San Francisco Bay.

Mountain View Shoreline Sea Level Rise Study, Mountain View, CA. 2012. For the City of Mountain View. Senior Coastal Engineer. ESA developed a comprehensive program to address long-term flood protection from sea-level rise (SLR) for the City's Shoreline Regional Park Community, a neighborhood that counts Google, Intuit, and LinkedIn among its residents. The goals of the Shoreline Sea Level Rise Study (Study) were to conduct a vulnerability assessment, assess adaptation alternatives, and develop a Capital Improvement Program (CIP) to address long-term flood protection from sea level rise for the Shoreline Community.

Alameda County Coastal Flood Study, CA. Project Director. Reviewed coastal flood studies by the US Army Corps and FEMA contractors, and recommended a methodology to complete the coastal flood studies in southern Alameda County.

Laguna Salada Feasibility Assessment at Sharp Park, Pacifica, CA. 2010 – 2012. Project Director. Working with the Wild Equity Institute, with input from the Center for Biological Diversity, ESA developed a preliminary feasibility assessment for long-term ecosystem rehabilitation of the Sharp Park / Laguna Salada barrier beach lagoon complex in Pacifica, CA. The project goal is to identify sustainable land and to create areas of natural coastal ecology and specific habitat for the San Francisco garter snake and California red-legged frog.

San Mateo County Coastal Levees. 2012. Project Director. ESA assisted the San Francisquito Creek Joint Powers Authority with its grant application for the California Department of Water Resources (DWR) Local Levee Assistance

Relevant Experience (Continued)

Program. The funding would be used to evaluate and design over 5 miles of the San Mateo County coastal levee—which lies just north of the Mountain View Shoreline study site.

Elkhorn Slough Management Studies: Inlet Stability and Alternatives Engineering, Moss Landing, CA. Bob led the analysis of tidal inlet morphology for two new inlets including evaluation of inlet cross section and associated tide range, and planform dynamics with and without stabilizing jetties. Bob also directed the engineering estimates for the enhancement alternatives which included re-routing the main channel, new mouth locations, and large tidal damping structures and sand placement to halt and reverse sediment export and loss of intertidal wetlands.

Hamilton Army Airfield Restoration: Tidal Wetlands Design Support, Novato, CA. For the US Army Corps of Engineers. Project Director. Directed wind wave analysis in order to develop estimates of total water levels criteria for new levees. Bob led investigation of potential levee erosion and to support design of a dissipative vegetated bench as an ecologically preferred approach to erosion control (vs. rock slope protection). Bob is presently Project Director for the design of the completion of the restoration construction with final construction expected in 2014.

Napa River Salt Marsh Restoration, Pablo Bay / Napa River, CA, 1998–2006. For the California State Coastal Conservancy, Department of Fish & Game and U.S. Army Corps of Engineers. Project director for a series of studies and design for restoration for the 10,000-acre Napa Salt Ponds Complex. Included conceptual design, modeling of hydrodynamics, sediment transport and salinity, habitat conversion modeling, engineering feasibility, final design and construction period services. Also, field data collection and analysis, and coordination with surveying and EIR/EIS preparation, and conformance with Corps' procedures. Engineer-in-charge of construction documents for the "Phase 1" restoration of Ponds 3, 4 and 5, which comprised about 3,000 acres, to tidal wetland. Construction was completed successfully in 2006.

Bahia Wetland Restoration Project, Lower Petaluma River and Black John Slough, Novato, CA, for the Marin Audubon Society. Engineer-in-charge for the planning, design, construction period services and monitoring approximately 400 acres of wetland restoration and other improvements on a project area of about 600 acres. Construction was completed successfully in 2008 (phase 1) and 2013 (phase 2), and the site is now being monitored.

Relevant Experience (Continued)

Petaluma Marsh Restoration Design, Novato, CA. 2001–2007, for the Marin Audubon Society. Project Director for the design of 100-acre tidal wetland restoration tributary to the Petaluma River. Included design of a flood control levee to mitigate tidal flooding and wave action to adjacent rail corridor. The project was successfully constructed in 2005-2007.

Martinez Regional Shoreline Marsh Restoration Project, CA. 1998–2002. Directed construction document preparation construction support activities for this combined flood control and tidal wetlands restoration project at the mouth of Alhambra Creek. The project satisfied mitigation requirements for Caltrans by providing Delta Smelt and other habitat, and has been monitored for 10 years.

Hyde Street Harbor Coastal Processes Study, and Water Quality Advisor, California, 1998-2001. For the Port of San Francisco and the Fisherman's Wharf Environmental Quality Advisory Committee (EQAC). Provided technical consultation focused on improving water quality in an area of intense, multiple uses ranging from swim clubs to fish processing.

Maintenance Dredging of Larkspur Ferry Terminal, California, 1989-2000. For the Golden Gate Bridge Highway and Transportation District. Project Engineer responsible for construction documents and permit applications for five episodes of maintenance dredging of the Larkspur Ferry Terminal Berthing Basin and Channel, including over 1,000,000 cubic yards of dredging and disposal.

IEPR - HSDRRS Research Summary & Armoring Guidance Manual. USACE and Battelle. Independent Peer Reviewer/Expert. The U.S. Army Corps of Engineers (USACE) is currently designing and constructing the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS). One of the vital components of the HSDRRS is the Armoring Research Summary and Armoring Guidance Manual (ARSAGM). It is a compilation and explanation of armoring R&D performed for this program and is intended to provide guidance to armoring designers such that an economical, yet flexible, solution to provide protected side wave overtopping erosion can be implemented for greater than the 100-yr and up to the 500-yr storm surge.

IEPR - Terrebonne Basin Barrier Shoreline Restoration, Terrebonne Parish, Louisiana Integrated Feasibility and EIS. Battelle. Independent Peer Reviewer/Expert.- Bob provided Independent Technical for this document, a project that will restore major reaches of the Terrebonne barrier islands chain (including the Timbalier and Isles Dernieres barrier islands). This would reduce the number of breaches, and enlarge (width and dune crest) the

Relevant Experience (Continued)

Isles Dernieres (East Island, Trinity Island, and Whiskey Island), Timbalier Island, and East Timbalier Island.

San Dieguito Lagoon Wetland Restoration Monitoring and Design Review, Del Mar, 2008 – Present. Project Director. For the California Coastal Commission. ESA is providing construction compliance monitoring and design review for the Southern California Edison's San Dieguito Wetland Restoration mitigation project on behalf of the Coastal Commission. In addition to monitoring, ESA has assisted the Coastal Commission with design review and developed the basis of design for tidal channels for wetlands created in two areas of the project.

Lower Santa Ynez River Estuary Restoration, 2012-2013. Clients- Audubon California, the California State Coastal Conservancy and the Department of Fish and Game. Project Director. ESA documented historic changes in land uses, hydrology and lagoon functioning to identify potential restoration opportunities to improve the ecological health of the Lower Santa Ynez River Estuary (approx. four river miles). One of these restoration actions is being developed to preliminary design.

Neskowin Shoreline Assessment, Neskowin, OR. 2012. For Tillamook County. Project Director and Engineer. In response to a high rate of erosion that has diminished the beaches and now threatens homes and roads in Neskowin, OR, ESA analyzed the viability of various coastal erosion mitigation strategies to an eroding shore.

Russian River Estuary Adaptive Management Plan, Jenner, CA. For Sonoma County Water Agency. Project Director / Senior Engineer. Developed an adaptive management plan for an outlet channel to reduce marine influence on the Russian River Estuary during the dry season. Also, provided initial assessment of flood proofing properties bordering the estuary in the community of Jenner. Directed wave transformations and evaluation of the effects of the exiting jetty on beach and inlet morphology.

Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) Conceptual Design, Puget Sound, WA. 2010 – ongoing. ESA Project Engineer. The ESA team prepared conceptual restoration designs for 30 nearshore sites throughout Puget Sound for PSNERP, a joint entity composed of the Corps of Engineers and WDFW. The multi-discipline team evaluated the effectiveness of about 60 proposed restoration projects. The work is presently being used for a USACE Feasibility Study.

Relevant Experience (Continued)

Sandy Point and Birch Bay Flood Studies, Whatcom County, WA, Project Director for two coastal flood and mapping studies located at Sandy Point and Birch Bay, generally near Bellingham, Washington. These projects were accomplished via the Cooperating Technical Partners (CTP) Mapping Activity Statement (MAS) between Whatcom County and the Federal Emergency Management Agency (FEMA) Region X. Completed in 2004, these were the first coastal flood studies to be completed in the Pacific Regions in many years. Findings contributed to FEMA's Guidelines for Pacific Coast Flood Studies published in 2005.

Relevant Experience (Continued)

Selected Papers and Published Reports

Brew, D.S., G. Guthrie, M. Walkden and R. T. Battalio, Sustainable coastal communities: the use of crenulate bay theory at different scales of coastal management, Littoral 2010, 06005 (2011)

Brew, D.S., Robert T. Battalio, Edward B. Thornton, Clifton Davenport and B. Damitz, Coastal Regional Sediment Management Planning In Southern Monterey Bay, California, Littoral 2010, 05009 (2011)

Revell, D.L., Battalio, B., Spear, B., Ruggiero, P, and Vandever, J., 2011. A Methodology for Predicting Future Coastal Hazards due to Sea level Rise on the California Coast. Journal of Climatic Change, December 2011, Vol. 109, Issue 1, Supplement, pp 251-276.

Revell, D.L., Robert Battalio, Justin Vandever, Brian Spear, Peter Ruggiero, Planning Level Assessment of the Impacts of Sea Level Rise to the California Coast, Solutions to Coastal Disasters, 2011, ASCE, pp 522-538.

Battalio, R.T., D. Danmeier and P. Williams, Predicting Closure and Breaching Frequencies of Small Tidal Inlets –A Quantified Conceptual Model. Proceedings of the 30th International Conference of Coastal Engineering, 2006, ASCE 2007, Vol. 4, 3937 - 3949.

Garrity, Nicholas J., Robert Battalio PE, Peter J. Hawkes PhD, Dan Roupe' Evaluation Of Event And Response Approaches To Estimate The 100-Year Coastal Flood For Pacific Coast Sheltered Waters, Proceedings of the 30th International Conference of Coastal Engineering, 2006, ASCE, 2007, Vol. 2, pp 1651-1663.

MacArthur, Robert C., Robert G. Dean and Robert Battalio, Wave Processes In Nearshore Environment For Hazard Identification Proceedings of the 30th International Conference of Coastal Engineering, 2006, ASCE, 2007, Vol. 2, pp 1775- 1787.

Coulton, Kevin G., Bob Battalio, Nick Garrity, Carmela Chandrasekera and Paula Cooper, Coastal Flood Studies in Puget Sound, Washington State, USA, Solutions to Coastal Disasters '02, Conference Proceedings, February 24–27, 2002, San Diego, CA, ASCE, pp 267–281.

Relevant Experience (Continued)

Brendan DeTemple, R.T. Battalio, and James Kulpa, Measuring Key Physical Processes in a California Lagoon, Proceedings of the 1999 Conference of the California Shore and Beach Preservation Association, Sand Rights '99, September 23–26, 1999, Ventura, CA, ASCE, pp 133–147.

Battalio, R.T. and R.B. Dornhelm, 1997. Sea level rise in San Francisco Bay, California. Proceedings of the 1997 National Marina Research Conference, International Marina Institute, 16 pp.

Battalio, R.T. and D. Trivedi, 1996. Sediment transport processes at Ocean Beach, San Francisco California. Proceedings of the 25th International Conference, ASCE, *Coastal Engineering* 3(208):2691–2704.

Battalio, R.T. and A. Bertolotti, 1987. Modeling Applications in Coastal Engineering. Proceedings: Coastal Zone '87 Conference, 5th Symposium on Coastal and Ocean Management, Vol. 2, pp. 1630-1643.

Nichol, J., R. Battalio, R. Nathan, R. Boudreau and D. Bombard, 1986. An Example of a Destination Harbor for Pleasure Craft. Bulletin of the Permanent International Association of Navigation Congress, PIANC, No. 55, pp. 33-43.

Battalio, R.T., 1985. A Comparison of Two Methods of Calculating Longshore Sediment Transport Rates Using Field Data. Masters Thesis, U.C. Berkeley, May.

Battalio, R.T., 1984. Selected Techniques for Measuring Directional Wave Spectra. Selected Reports in Ocean and Arctic Engineering, U.C. Berkeley.

James B. French, PE, GE

Principal Geotechnical Engineer

Professional summary

Mr. French has over 30 years of experience in geotechnical, environmental, and construction engineering. He has served as project manager or design engineer on a wide range of projects, including earth dams, levees, landslides, port facilities, waste treatment and handling, hazardous waste disposal cells, office buildings, and subdivisions. He has been responsible for preparing and reviewing geotechnical reports, complex calculations, plans, and specifications. He is experienced with field construction control for earth dams, landslides, other large grading projects, a box culvert, disposal cell, and subdivisions. In addition, he is experienced with foundation excavation and shoring for numerous buildings, from large offices to single-family homes. Mr. French has directed geotechnical laboratory testing for many of the above projects and has performed laboratory testing for numerous others. He has performed computer analyses for slope stability, liquefaction, seismic deformation, bearing capacity, and consolidation.

Mr. French has been responsible for many geotechnical and foundation investigations. Projects have included foundation investigations for buildings of all sizes, many with significant geotechnical hazards such as soft foundation soils, slope stability problems, liquefaction potential, and expansive soils. Other projects include braced excavations approximately 60 feet deep, earth dams, landslides approximately 100 feet deep and thousands of feet long, quarry wall stability, and ocean bluff stability. Mr. French has coordinated many studies with geologists to consider faulting, rock structure, and history of deposition and sliding.

Environmental engineering responsibilities have ranged from the design and implementation of innovative pilot-scale test programs for properties of treated waste, to the configuration of hazardous waste disposal cells and the investigation of contaminated groundwater for landfills, gas stations, and a business park.

Construction engineering responsibilities have included the supervision of earthwork control for the preparation, construction, and rehabilitation of earth dam foundations, as well as for slide repairs and subdivision grading. Mr. French has inspected foundation excavation, pile driving, and retaining wall backfill; he has provided construction control for large box culverts, roads, and other structures; and he has installed piezometers and monitoring wells for dams, slides, and contamination studies. In addition, he has supervised a geotechnical laboratory and designed numerous laboratory programs.

Professional qualifications/registration(s)

Geotechnical Engineer, CA No. GE2018, 1987
Professional Engineer, CA No. C36453, 1983

Education

M.S., Geotechnical Engineering, University of California, Berkeley, 1982
B.S., Civil Engineering, University of California, Berkeley, 1978

Memberships/Affiliations

American Society of Civil Engineers
San Francisco Geo-Institute Chapter (past chair)
International Society of Soil Mechanics and Foundation Engineering
Earthquake Engineering Research Institute
Tau Beta Pi, National Engineering Honor Society

Representative projects

Geotechnical

San Francisco Bay Area Rapid Transit (BART) District Earthquake Safety Program, Onshore Vibro-Replacement and Grouting along Transbay Tube, BART, Oakland, CA
0058480034. Task manager for geotechnical support during the construction of more than 900 stone columns in the Port of Oakland, the first mitigation measure of the billion-dollar BART Earthquake Safety Program. Responsible for working with the contractor to develop data collection and reporting methods that would meet the contractual requirements and optimize information about the quality of the stone column installation methods. After the initial test area did not produce the required densification, worked with the contractor to develop and evaluate improved installation procedures to meet the contract performance criteria. Provided a final review of all borings drilled to evaluate conformance to performance criteria, and developed improved performance criteria to address specific conditions encountered during testing. Recommended remedial measures as needed where performance criteria were not met.

San Francisco Bay Area Rapid Transit (BART) District Earthquake Safety Program, Offshore Demonstration Program for Vibro-Replacement along Transbay Tube, BART, Oakland, CA
0058480036. Task manager responsible for providing geotechnical direction during the construction and testing of more than 90 demonstration stone columns and vibro-compaction points. The work was performed in 35 to 90 feet of water to evaluate the ability to position, install, and test stone columns and vibro-compaction in the San Francisco Bay. The demonstration program included elaborate survey control, pretreatment testing with borings and cone penetrometer tests (CPTs), installation of stone columns and vibro-compaction points, posttreatment testing with borings and CPTs, and evaluation of the penetrability of the thickened stone blanket of a scour-prone portion of the Transbay Tube with sonic drilling and vibro-densification equipment. Provided extensive reviews and feedback during the development and testing of several survey control methods, including differential GPS, sonar, and laser-gyro, as well as MiniSpool technologies. Managed and evaluated geotechnical testing that included standard penetration tests, large-diameter penetration tests, CPTs, and laboratory tests.

California High-Speed Train, San Jose to Merced Segment, California High Speed Rail Authority, Santa Clara, San Benito, Merced, and Madera Counties, CA
0145060000. Lead geotechnical engineer for ongoing geologic and geotechnical studies of the proposed High Speed Train, San Jose to Merced segment. Previously provided preliminary recommendations for numerous aerial structures, bridges, cuts, fills and about 9 miles of tunnels through Pacheco Pass. Current scope includes geologic and geotechnical services to support 30 percent design phase.

Caltrain Grade Separation Projects, San Bruno and South San Francisco, CA
Prior Firm Experience. Project manager for a geotechnical investigation of two miles of mechanically stabilized earth (MSE) embankment. The proposed project, which was to include a station with stairwells and elevator pits, would raise the commuter and freight railroad tracks 16 feet to cross above surface streets. Because more than 3,000 feet of this length are immediately adjacent to the San Francisco Bay Area Rapid Transit District (BART), we developed recommendations to use lightweight foam concrete so that overburden pressures on the BART subway would not be increased. Portions of the site are underlain by compressible clays or liquefiable silty sands; other reaches overlie soft, compressible clays and liquefiable soils. Evaluated settlement and global stability.

Centralized Equipment Maintenance and Operations Facility (CEMOF), HNTB/Peninsula Corridor Joint Powers Board, San Jose, CA
Prior Firm Experience. Project manager for a geotechnical investigation that involved a four-story

administration building, tunnel for pedestrian and equipment travel, large maintenance building with drop tables and inspection pits for locomotives and railcars, tall community wall, and track relocation. Scope included a field investigation with cone penetration testing and geotechnical borings, as well as laboratory testing to evaluate strength and other relevant soil properties. Performed geotechnical analyses of liquefaction potential, allowable bearing capacities for shallow spread footings, and auger cast piles. Worked with the design team to evaluate the magnitude and significance of settlement under large column loads in the administration building. Evaluated several alternative foundation systems and consulted with the project's value engineering team.

Pile Load Test, Centralized Equipment Maintenance and Operations Facility (CEMOF), San Jose, CA
Prior Firm Experience. Project manager for a pile load test program to compare and evaluate axial capacities of continuous flight auger piles, driven prestressed precast concrete piles, and driven H-piles. The program included using a pile driving analyzer with the CAPWAP software program and compression and conducting tension load tests on eight piles. Developed recommendations for the preferred alternatives.

Santa Clara to Diridon Corridor Improvement, HNTB/Peninsula Corridor Joint Powers Board, San Jose, CA
Prior Firm Experience. Project manager for a geotechnical investigation for the widening of three rail bridges, construction of new pedestrian tunnels and ramps beneath tracks at the Santa Clara and Diridon stations, and modifications to the support of the existing San Carlos Street overcrossing above the Caltrain rail lines. Scope ranged from conducting a field investigation with geotechnical borings and laboratory testing to evaluating strength and other relevant soil properties. Performed geotechnical analyses of liquefaction potential, developed Caltrans and AREMA (American Railway Engineering and Maintenance-of-Way Association) seismic acceleration response spectra, and provided static and seismic earth pressures as well as surcharge loads on tunnel walls beneath rail tracks. Developed recommendations for shallow spread footings and axial and lateral load capacities for driven concrete piles, driven steel piles, and auger cast piles.

Wharf and Embankment Strengthening Program (WESP), Port of Oakland, Oakland, CA
Prior Firm Experience. Project manager for a geotechnical evaluation of static and seismic stability of existing wharves and embankments prior to a berth deepening program. The project included ground motion evaluation, calibration of a finite-difference computer model with performance in the Loma Prieta earthquake, and deformation estimates for various design-level earthquakes.

Extension to San Francisco International Airport (SFO), San Francisco Bay Area Rapid Transit (BART) District, San Mateo County, CA
Prior Firm Experience. Lead geotechnical engineer for the final design-level geotechnical investigation of an eight-mile extension of BART to SFO, a design-build turnkey concept project. Reviewed field and laboratory investigations and provided the technical lead for a geotechnical evaluation of subway, buried passenger stations, at-grade trackway, and aerial guideway segments. Prepared the geotechnical engineering design recommendations and reports on liquefaction potential, foundations for structures, and earthwork requirements in accordance with BART design criteria and contract specifications.

San Bruno Station, San Francisco Bay Area Rapid Transit (BART) District, San Bruno, CA
Prior Firm Experience. Lead geotechnical engineer for the final design of a new BART station. The station features a below-grade structure connecting to new subway sections of the main BART alignment, with a covered concourse level and at-grade police station located immediately south of the Tanforan Shopping Center. Additional project elements included a five-level garage with more than 1,100 parking spaces; a two-span bridge access ramp to the garage from street level; a bus terminal; and various street improvements, including the relocation of Huntington Avenue.

Geotechnical services to support the design included the review of existing data, subsurface investigation and testing, engineering analysis, and development of design recommendations.

South San Francisco Station, San Francisco Bay Area Rapid Transit (BART) District, South San Francisco, CA
Prior Firm Experience. Lead geotechnical engineer for the final design of a new BART station. The station features a multilevel parking structure, a roof structure over the station shell, a plaza and concourse level that includes canopies over the entry gates, and bus bays with canopies and bollards. Seismic hazards included liquefaction and seismically induced settlement of the parking structure. Geotechnical services to support the design included the review of existing data, subsurface investigation and testing, engineering analysis, and development of design recommendations.

Review of Various Geotechnical Investigations and Geologic Hazards Evaluations, County of Alameda, CA
Prior Firm Experience. Project manager for the review of geologic hazards evaluations, both within and near Alquist-Priolo earthquake fault zones. Reviewed geotechnical investigations for developments with complex geotechnical or geologic conditions.

Student Athlete High Performance Center, University of California, Berkeley
0107660000. Lead geotechnical engineer for a new athletic facility immediately adjacent to California Memorial Stadium. Project includes tied-back and soil nailed excavations to support existing Memorial Stadium footings; temporary and permanent dewatering, and mat foundation. Provided construction observation services during excavation and shoring work.

California Memorial Stadium, University of California, Berkeley
0107660000. Project Engineer for complex geotechnical issues associated with seismic strengthening of this stadium that sits astride the active Hayward Fault. Provided non-linear static and dynamic properties for foundations, ground improvement, and retaining structures. Developed geotechnical aspects of concrete foundation blocks that will straddle the fault, where low interface frictional resistance was desired between the foundation and the ground to minimize forces exerted on the superstructure in the event of fault surface rupture.

Law & Business Connection Building, University of California, Berkeley
0110840000. Lead geotechnical engineer for new five- and six-story academic towers, a three-story atrium, and a basement auditorium. The basement will be approximately 25 feet deep.

Mission Bay Campus, University of California, San Francisco, CA
Prior Firm Experience. Performed a geotechnical review for several buildings on a new campus. The project included reviewing a surcharge program (with wick drains), and making recommendations about suitable piles to be constructed in liquefiable fill overlying compressible Bay Mud.

Burlingame Corporation Yard, City of Burlingame, CA
Prior Firm Experience. Project manager for new corporation yard buildings and parking area at a site located on shallow fill over Bay Mud. Concerns included bearing capacity, settlement, and compression of Bay Mud.

Alameda Point Golf Course, City of Alameda Reuse and Redevelopment Authority, Alameda, CA
Prior Firm Experience. Project manager for a preliminary civil and geotechnical evaluation and recommendations for a proposed golf course to be built of dredged material from the adjacent Port of Oakland.

Alameda Point Technical Review, City of Alameda Reuse and Redevelopment Authority, Harris & Associates, Inc., Alameda, CA
0139310000. Reviewer for the City for the residential and commercial redevelopment of the former

Alameda Naval Air Station. Geotechnical hazards include liquefaction, slope stability along the estuary, and settlement related to consolidation of the Bay Mud underlying the site. Provided input considered by the developer to reduce costs and improve seismic performance.

Valley Transit Authority (VTA) Maintenance Facilities Investigation, Santa Clara Valley Transit Authority, San Jose, CA
Prior Firm Experience. Project manager for geotechnical investigations for two new maintenance facilities located on or near potentially liquefiable soils.

Office Foundation Investigation, Macronix America, Milpitas, CA
Prior Firm Experience. Geotechnical task manager for a foundation investigation for a 150,000-square-foot office complex and parking lots. Design considerations included the potential for liquefaction and seismically induced settlement.

Willow Street Rail Bridge Site-Specific Response Analysis, HNTB/Peninsula Corridor Joint Powers Board, San Jose, CA
Prior Firm Experience. Project manager for a seismic site-specific response analysis for a 100-foot Caltrain rail bridge supported on soft soils located near the San Andreas, Hayward, and Monte Vista-Shannon faults. The Caltrans reviewer accepted the recommended acceleration response spectra without modification.

Hillcrest Boulevard Underpass, HNTB/San Francisco Bay Area Rapid Transit (BART) District, County of San Mateo, CA
Prior Firm Experience. Lead geotechnical engineer for a road crossing under Caltrain tracks and over the new BART subway.

Lawrence Station Crossing, HNTB/Peninsula Corridor Joint Powers Board, County of Santa Clara, CA
Prior Firm Experience. Lead geotechnical engineer for a pedestrian crossing beneath Caltrain tracks.

Bowers Avenue Rail Bridge, San Tomas Rail Bridge, and Sunnyvale Station Improvements, HNTB/Peninsula Corridor Joint Powers Board, County of Santa Clara, CA
Prior Firm Experience. Geotechnical reviewer for a project involving both the widening of two rail bridges and the upgrade of the Sunnyvale station to accommodate two additional Caltrain track lines.

Sewer Outfall Consolidation Box Culvert, City & County of San Francisco, CA
Prior Firm Experience. Engineer. Served on construction management team for a one-mile section of San Francisco's box culvert sewer system. Responsibilities included field supervising, surveying, keeping job records, and updating a computer-run Critical Path Method schedule.

Honker Bay Pipeline, Chevron, Pittsburg, CA
Prior Firm Experience. Project manager. Geotechnical investigation of a proposed directional drill for a 4,355-foot Chevron replacement pipeline that crosses Suisun and Honker bays. Evaluated subsurface conditions, directional drilling issues, construction supporting the receiving pits at the south and north ends, soil corrosion potential, geologic hazards, and anticipated ground motions, including shear and compression wave velocities.

Veritas Corporate Campus, Veritas Software Corporation, Mountain View, CA
Prior Firm Experience. Geotechnical task manager for a foundation investigation for a 427,000-square-foot office complex and a 115,000-square-foot, three-story parking garage.

Veritas Campus II, Veritas Software Corporation, Milpitas, CA
Prior Firm Experience. Geotechnical task manager for a foundation investigation for a pile-supported 990,000-square-foot office complex and parking lots. The design considerations included potential

for liquefaction and seismically induced settlement.

Superfund Site Remediation and Development Services, Veritas Software Corporation, Mountain View, CA
Prior Firm Experience. Principal geotechnical engineer for environmental and geotechnical services for a 19.5-acre former Superfund site purchased for redevelopment into a corporate campus. The site was formerly used for manufacturing semiconductor components. We provided ongoing remediation after installing a soil vapor extraction and treatment system, groundwater extraction and treatment system, and perimeter slurry wall. New construction included four 4-story office buildings totaling 427,000 square feet and a vapor barrier below concrete slab consisting of impervious high-density polyethylene (HDPE) materials, with all joints and penetrations sealed with a passive ventilation system. Additional construction included a commons building, a 3-story parking structure totaling 115,000 square feet, and surface parking lots. Developed and provided oversight for all geotechnical construction activities.

Concord Office Plaza, Wieting, Confer & Nance, Concord, CA
Prior Firm Experience. Lead geotechnical engineer for a foundation investigation for a 10-story, 125-by 250-foot office building with a 60-foot-deep tied-back excavation to develop a 6-story parking basement.

San Pablo Pointe Subdivision, The Anden Group, El Sobrante, CA
Prior Firm Experience. Performed a geotechnical investigation for a 135-acre subdivision with a million cubic yards of slide mitigation work and a million cubic yards of additional grading.

Numerous Pile Driving Projects, InSituTech, San Francisco Bay Area, CA
Prior Firm Experience. Monitored pile driving operations, including operation of pile driving analyzer (PDA) and evaluation of pile capacities and pile integrity.

Suspension Foot Bridge, Belize River, Youth With a Mission, Belize, Central America
Prior Firm Experience. Performed soil investigation, selected abutment locations and setbacks, and provided geotechnical design parameters for a 300-foot bridge.

Sewer Outfall Consolidation Box Culvert, City & County of San Francisco, CA
Prior Firm Experience. Engineer on construction management team for a one-mile section of San Francisco's box culvert sewer system.

Geotechnical Investigation for Numerous Remove-and-Replace Slide Repairs, Numerous property owners, insurance companies, and attorneys, San Francisco Bay Area, CA
Prior Firm Experience.

Three-Dimensional Rock-Block Stability Analysis of Ocean Bluff, Homeowner, Palos Verdes, CA
Prior Firm Experience. Developed a computer model to evaluate the stability of a high, near-vertical ocean cliff composed primarily of hard rock but with occasional weak clay beds that dipped out of the slope.

Stanley Hall Seismic Retrofit, University of California, Berkeley, CA
Prior Firm Experience. Performed a review and provided consultations regarding shoring stability and design in sheared rock; also consulted on foundation design, including appropriate dynamic stiffness and bearing capacity.

CITRIS Headquarters/Davis Hall North Replacement Project, University of California, Berkeley, CA
Prior Firm Experience. Performed reviews and provided consultations regarding foundation selection/design and rock and soil strengths for shoring; also provided construction support.

King Student Union, University of California, Berkeley, CA
Prior Firm Experience. Lead geotechnical engineer in developing geotechnical parameters for use in the seismic evaluation of the existing structure.

Caldecott Tunnel Improvement Project, Parsons Transportation Group, Inc., Contra Costa and Alameda Counties, CA
0073210000. Task manager for a geotechnical investigation and recommendation for the lifeline control building and several retaining walls for the proposed fourth-bore tunnel alignment.

Hollister DWTS Improvement Project, City of Hollister, Hollister, CA
0122950000. Ground improvement consultant. Assisted in evaluating the procedures used by the stone column contractor and the quality of the final product with regard to liquefaction mitigation. Responsibilities included reevaluating the performance criteria.

San Francisco Bay Area Rapid Transit (BART) District On-call General Engineering Services, Jacobs Engineering Group, San Francisco Bay Area, CA
0140310000. Project manager: As part of ongoing geotechnical support of BART's Maintenance and Engineering Department, performed a geotechnical peer review of the engineering calculations, geotechnical design reports, and contract documents, which included specifications and design drawings of the Fremont Central Park Subway and the design-build portion of the project. This extension (south from the Fremont Station along a 5.4-mile-long corridor to just north of Mission Boulevard) will include the proposed Irvington and Warm Springs stations. One segment involves an approximately 1.4-mile-long stretch that includes an embankment through South Tule Pond, U-walls as the tracks transition from at grade to below grade, a subway box that will cross beneath Lake Elizabeth, and U-walls as the tracks return to above grade.

Dams and Levees

Uvas Creek Levee, Schaaf & Wheeler Consulting Civil Engineers, Gilroy, CA
0138150010. Project manager. Conducted geotechnical engineering analyses for the Santa Clara Valley Water District (SCVWD) and City of Gilroy (including reconnaissance, geotechnical properties, erosion, settlement, liquefaction hazard, slope stability, seismic deformation, and impact on appurtenant structures). Prepared documentation as necessary to complete the SCVWD's recertification of levees to meet Federal Emergency Management Agency (FEMA) mapping standards. The approximate length of levee for recertification was 2.2 miles. Responsibilities included directing another consultant in field and laboratory investigations.

Stevens Creek Levee, Schaaf & Wheeler Consulting Civil Engineers, Mountain View, CA
0138150020. Project manager. Conducted geotechnical engineering analyses for the Santa Clara Valley Water District (SCVWD) and City of Mountain View (including reconnaissance, geotechnical properties, erosion, settlement, liquefaction hazard, slope stability, seismic deformation, and impact on appurtenant structures) and prepared documentation as necessary to complete the SCVWD's recertification of levees to meet Federal Emergency Management Agency (FEMA) mapping standards. The approximate length of levee for recertification was 2.3 miles. Responsibilities included directing another consultant in field and laboratory investigations.

Lower Penitencia Creek Levee, Schaaf & Wheeler Consulting Civil Engineers, Milpitas, CA
0138150030. Project manager. Conducted geotechnical engineering analyses for the Santa Clara Valley Water District (SCVWD) and City of Milpitas (including reconnaissance, geotechnical properties, erosion, settlement, liquefaction hazard, slope stability, seismic deformation, and impact on appurtenant structures) and prepared documentation as necessary to complete the SCVWD's recertification of levees to meet Federal Emergency Management Agency (FEMA) mapping standards. The approximate length of levee for recertification was 0.75 mile. Responsibilities included directing another consultant in field and laboratory investigations.

Department of Water Resources (DWR) Urban Levee Geotechnical Evaluations Project, Natomas East Main Drainage Canal (NEMDC) - East Study Area, URS Corporation, Sacramento County, CA
0127650010. Senior consultant. Developed schematic remedial schemes to be applied to all levees in this project.

South Bay Salt Pond Restoration Project, Ravenswood Pond SF2, Cascade Design Professionals, Inc., Menlo Park, CA
0141680000. Project manager for a geotechnical investigation in support of the restoration of approximately 130 acres as a tidal wildlife area. Work included slope stability and settlement analyses as well as subsurface exploration on levees and soft pond bottoms with a low-ground-pressure rig. Recommendations were developed for the construction of bird nesting islands, a pair of tidal hydraulic structures to create a flushing flow of bay water to reduce the salt accumulations of past years, and pile support systems for two wildlife viewing platforms.

Cherry Flat Dam, City of San Jose, San Jose, CA
Prior Firm Experience. Conducted a seismic evaluation of Cherry Flat Dam, including analyses of slope stability, deformation, and probabilistic seismic hazard in accordance with the California Division of Safety of Dams guidelines.

Cull Creek and Don Castro Dams, County of Alameda, CA
Prior Firm Experience. Project manager for a preliminary seismic evaluation of the stability of two earth dams. Responsibilities included reviewing original geotechnical investigations, design drawings, and construction records from the early 1960s. Reviewed California Division of Safety of Dams project files for relevant information. Evaluated seismic ground motion, liquefaction potential, static and seismic slope stability, and likely seismic slope deformation. Provided input to the county for planning purposes.

Alvarado Flood Levee, Seismic Stability and Deformation Analyses, County of Alameda, Union City, CA
Prior Firm Experience. Project manager for an evaluation of liquefaction mitigation needs for 4,750 feet of flood control levee. Performed analyses of probabilistic seismic hazard, slope stability, and seismic deformation. Recommended against the mitigation work that had been suggested by a previous consultant, saving the client $400,000.

Stevens Creek Dam Seismic Rehabilitation, Santa Clara Valley Water District, Saratoga, CA
Prior Firm Experience. Resident earthwork inspector for the seismic stability modification of Stevens Creek Dam. Observed the placement of 400,000 cubic yards of embankment materials for upstream and downstream buttresses, to a maximum height of nearly 200 feet. Supervised testing and approved foundation preparation, borrow sources, and riprap placement.

Brunswick Canyon Dam Construction, City of Carson, Carson City, NV
Prior Firm Experience. Engineer/inspector for Carson City Dam, a storage dam for treated wastewater for agricultural use. Designer's representative during preparation of the foundation, which included fractured hard andesite, friable tuff, and soil; preparation of the borrow area; and placement of clay core, shells, internal drains, and riprap.

Eagle Canyon Dam, Riverside County Flood Control District, Cathedral City, CA
Prior Firm Experience. Primary design engineer for a flood detention earth embankment dam and a preliminary layout of spillway through rock cut. Coordinated and participated in a geologic and geophysical investigation of site conditions.

Levee Stability Evaluation, U.S. Army Corps of Engineers, West Sacramento and Cache Slough, Yolo and Solano Counties, CA
Prior Firm Experience. Evaluated embankment and foundation stability for more than 10 miles of

levees.

Rio Bravo Diversion Dam, Kern County, CA
Prior Firm Experience. Design engineer for a preliminary design for a rockfill diversion dam to divert water into an aqueduct for low-head hydroelectric power generation on the Kern River.

Dam Integrity Review, County of Santa Clara, CA
Prior Firm Experience. Participated in an integrity review of numerous small dams in the Santa Clara Valley.

Gabion Creek Bank Repair, Confidential Client, Walnut Creek, CA
Prior Firm Experience. Developed plans and specifications for the repair of a creek bank using gabion baskets. Performed a field survey and construction observations.

Hazardous Waste, Landfills, and Environmental Engineering

Kingsland Landfill Closure, EnCap Golf Holdings, Lyndhurst and North Arlington, NJ
Prior Firm Experience. Project geotechnical consultant responsible for analyzing the performance of a landfill cap and proposed golf course to be constructed over 100 feet of existing municipal solid waste that overlie thick compressible varved clays. Performed an analysis for short- and long-term settlement of waste and compressible varved clays. Directed detailed analysis to evaluate the effect of the cover and golf course grading on slope stability. The designer took our initial feedback into account and modified grading to limit the impact on the factor of safety to an acceptable level.

Meadowlands Golf Redevelopment Project, EnCap Golf Holdings, Lyndhurst and North Arlington, NJ
Prior Firm Experience. Project geotechnical consultant for developing geotechnical monitoring plans for the closure of several golf courses. Monitoring included settlement platforms, inclinometers, vibrating wire piezometers, Borros settlement anchors, liquid settlement systems, and magnetic extensometers.

Chemically Stabilized/Solidified (CSS) Grout Pilot-Scale Test Pads, U.S. Department of Energy, Weldon Spring Site Remedial Action Project, St. Charles County, MO
Prior Firm Experience. Designed an innovative pilot-scale test pad program to evaluate geotechnical properties of treated mixed low-level waste. Prepared drawings and specifications and directed the cost estimate and field execution of the test program. Tests included grout pumpability using concrete pumps; evaluation of rate of setup and strength gain; variation of slump as a function of mix proportions and time since mixing; radon emanation; erodibility; permeability; and ability to support construction equipment traffic. Recommendations from this test program led to the selection of conventional concrete pumps (rather than concrete trucks) to transport and place 200,000 cubic yards of CSS grout up to 1,000 feet (from the treatment to the disposal cell).

Waste Placement Plan, U.S. Department of Energy, Weldon Spring Site Remedial Action Project, St. Charles County, MO
Prior Firm Experience. Participated in value engineering sessions to evaluate alternatives for waste treatment, waste placement techniques, and final waste configurations. The bulk of the waste was radioactively and chemically contaminated and consisted of approximately 200,000 cubic yards of raffinate sludges to be treated, 60,000 cubic yards of metal building debris and process equipment, 100,000 cubic yards of concrete rubble, and 500,000 cubic yards of contaminated soil; asbestos-contaminated material, wood, gravel, and miscellaneous materials made up the remainder of the waste. Wrote an outline and the final specifications for the placement of these wastes in a disposal cell. Developed a system for projecting and tracking waste quantities to balance sensitive proportioning throughout placement operations. Assisted with field observations during waste placement.

Raffinate Pit Dike Stability Evaluations, U.S. Department of Energy (DOE), Weldon Spring Site Remedial Action Project, St. Charles County, MO
Prior Firm Experience. Performed several evaluations of stability of raffinate pit dikes. Four pits contained nearly 200,000 cubic yards of radioactive and chemically contaminated raffinate sludges. Provided guidance to the U.S. DOE project director about risk management for dikes with calculated marginal stability. Provided emergency evaluation and preliminary recommendations in response to the development of a landslide on the outside of one dike, including same-day response to DOE and contractor project directors. Recommendations were used to inform the media of the situation and subsequently to design remedial action. Also performed a general dike stability evaluation, which received the concurrence of a Federal Energy Regulatory Commission (FERC) reviewer.

Final Site Grading Plan, U.S. Department of Energy, Weldon Spring Site Remedial Action Project, St. Charles County, MO
Prior Firm Experience. Developed a preliminary grading plan for a 200-acre site following placement in a disposal cell of contaminated materials originally distributed throughout the site. Developed guidelines for the preparation of final grading plans, suggesting an observational approach to adjust grades as the actual extent of contamination was discovered.

Foundation Investigation, CSS Plant, U.S. Department of Energy, Weldon Spring Site Remedial Action Project, St. Charles County, MO
Prior Firm Experience. Prepared a foundation investigation report for a multimillion-dollar sludge treatment plant. Recommendations included using secondary containment basins and evaluating the rate of potential spill infiltration through a clay liner.

Groundwater Contamination Investigation, U.S. Department of Energy, Weldon Spring Site Remedial Action Project, St. Charles County, MO
Prior Firm Experience. Provided engineering supervision of the field collection of soil samples to evaluate the spread of contamination from raffinate pits. Assisted with the preliminary evaluation of data.

Business Park Environmental Assessment, Confidential Client, Milpitas, CA
Prior Firm Experience. Designed and implemented a groundwater monitoring and analysis program for business park development prior to sale.

Landfill Closure, University of California, Davis, CA
Prior Firm Experience. Evaluated the construction as well as the short-term and final slope stability of a proposed municipal landfill (Operable Unit 2). Evaluated interface friction angles, foundation strengths, and waste strengths. The site included liquefaction potential of some foundation soils.

Landfill Closure, University of California, Davis, CA
Prior Firm Experience. Evaluated the shallow and deep slope stability of an old municipal landfill (Operable Unit 1) for final closure.

Oyster Point Landfill, South San Francisco, CA
Prior Firm Experience. Prepared an emergency response contingency plan (ERCP) to define the actions required in response to certain major triggering events considered to pose a potential risk of releasing contaminants into the environment from the closed Oyster Point Landfill. Triggering events include a large earthquake, tidal action, or erosion following heavy rainfall.

Kettleman Hills Facility, B-19 Class 1 Landfill, Kings County, CA
Prior Firm Experience. Provided an analysis of static and seismic slope stability and seismic deformation predictions for a new Class I landfill.

Liquefaction Analysis, Confidential Client, San Leandro, CA
0125990000. Reviewed previous consultant's liquefaction analysis and mitigation recommendations for a proposed replacement hospital. Provided review comments and recommendations that resulted

in a saving of several million dollars.

Healthcare

Kaiser Deer Valley Medical Center, Kaiser Permanente Capital Projects, Antioch, CA
Prior Firm Experience. Project manager for the final pile design for a new hospital, including the design and evaluation of an indicator pile program. The project included micropiles to provide support to a four-story structure adjacent to a 16-foot basement excavation. Also included was the evaluation of a soil nail wall along the driveway access.

Kaiser Vallejo Medical Center, Kaiser Permanente Capital Projects, Vallejo, CA
Prior Firm Experience. Technical reviewer. Provided a geotechnical review of field exploration and development of design recommendations for a drilled pier foundation. Project manager during the earthwork and construction of the 50- to 80-foot drilled pier foundation.

Medical Center at Mission Bay Geotechnical and Geohazard Investigation, University of California San Francisco Medical Center, Mission Bay Campus, University of California, San Francisco, CA
0133700000. Project manager for a 650,000-square-foot medical campus on a 14-acre site. Phase 1 includes a 289-bed women's and children's hospital, a 70-bed cancer hospital, an ambulatory care center, a 40,000 gross-square-foot central utility plant, and associated site work. We investigated the site, performed geological and geotechnical analyses and evaluations, and developed seismic design criteria and geotechnical recommendations for approval by the California Office of Statewide Health Planning and Development (OSHPD).

Stanford Outpatient Center Geotechnical Investigation and Construction, Stanford University, Redwood City, CA
0120110000. Project manager for the geotechnical investigation and construction support for a major remodel of four 3- and 4-story concrete-frame structures. The recommendations provided for micropiles constructed with low-overhead clearance, subgrade modulus and settlement estimates for new and existing foundations, and general earthwork activities in shallow groundwater conditions.

Peer Review and Expert Witness

Liquefaction Guidance Document, County of Alameda, CA
Prior Firm Experience. Primary author and lead facilitator of a team of three consulting firms retained to prepare a consensus guidance document to be used for all geotechnical work subject to county review and with a potential liquefaction hazard at the site.

Geotechnical Reviewer for Numerous Geotechnical Investigations and Geologic Hazards Evaluations, County of Alameda, CA
Prior Firm Experience. Geotechnical reviewer and consultant for Alameda County Public Works for seven years. Reviewed geotechnical investigations for developments with complex geotechnical, geologic, or foundation conditions.

Pump Station Shoring Failure Evaluation, Contractor's Insurance Company, San Rafael, CA
Prior Firm Experience. Evaluated a failed 25-foot-deep braced excavation in Bay Mud for a sanitary pumping station.

Geotechnical Evaluations, Miscellaneous Attorneys and Insurance Companies, San Francisco Bay Area, CA
Prior Firm Experience. Performed numerous investigations for a variety of slides and distressed structures.

Quality Improvement
Facilitator for Morrison Knudsen's Total Quality Management Team, which developed a report standard to guide the preparation of future reports in the Western Region.

Certifications

OSHA 40-hour HAZWOPER, Hazardous Materials
OSHA 8-hour Refresher, Hazardous Materials
Radiation Safety and Use of Nuclear Gauges Hazardous Materials, CA

Publications and presentations

"Geotechnical Aspects of Failures at Port-au-Prince Seaport during the 12 January 2010 Haiti Earthquake." R. A. Green, S. M. Olson, B. R. Cox, G. J. Rix, E. Rathje, J. Bachhuber, J. French, S. Lasley, and N. Martin. *Earthquake Spectra,* The Professional Journal of the Earthquake Engineering Research Institute, Volume 27, Number S43, October 2011.

"Documenting Liquefaction and Lateral Spreading Triggered by the 12 January 2010 Haiti Earthquake." S. M. Olson, R. A. Green, S. Lasley, N. Martin, B. R. Cox, E. Rathje, J. Bachhuber, and J. French. *Earthquake Spectra,* The Professional Journal of the Earthquake Engineering Research Institute, Volume 27, Number S93, October 2011.

"Geotechnical Engineering Reconnaissance of the 2010 Haiti Earthquake." Report of the National Science Foundation-Sponsored Geoengineering Extreme Events Reconnaissance (GEER) Team. E. Rathje, J. Bachhuber, B. Cox, J. French, R. Green, S. Olson, G. Rix, D. Wells, O. Suncar. GEER Association Report No. GEER-021. February 22, 2010.

"Clarifying the Application of Subgrade Modulus in Structural Analysis and Design." J. French, D. Mack, R. Shafer, and K. Moore. Proceedings of the 100th Anniversary Earthquake Conference Commemorating the 1906 San Francisco Earthquake, San Francisco, CA. April 2006.

"Importance of Seismological-Geotechnical-Structural Handshake in Performance-Based Design of Waterfront Structures." J. French, J.P. Singh, and M. Tabatabaie. Proceedings of the Structural Engineers World Conference 2002 in Yokohama, Japan. 2002.

"Importance of Seismological-Geotechnical-Structural Handshake in Performance-Based Design of Waterfront Structures." J. French, J.P. Singh, and M. Tabatabaie. Proceedings of the Structural Engineers Association of California Convention 2002, Santa Barbara, CA. September 2002.

"Geotechnical and Ground Motion Issues in Seismic Vulnerability Assessment of Existing Wharf Structures." J. French, J.P. Singh, and M. Tabatabaie. ASCE Ports 2001 Conference, Norfolk, VA. April 29–May 2, 2001.

"Evaluation of Weldon Spring Mixed Waste Placement Alternatives." J. French, G.R. Thiers, and D.W. Reppond. R&D '92, *Proceedings of the National R&D Conference on the Control of Hazardous Materials, San Francisco, CA*. February 1992.

"Landslide Investigation Utilizing Electric Cone Penetration Testing." J. French and A. Kropp. *Use of In Situ Tests in Geotechnical Engineering, Geotechnical Special Publication No. 6.* Samuel P. Clemence, ed. 1986.

"Pore-Pressures in the Design of Embankment Dams." J. French. *California Engineer*. May–June 1983.